subject becomes more intensely pursued in American Universities the contact with philology, anthropology, history, and allied subjects will increase. To group "philological science" with "history of science" is absolutely unnatural; it has an implication, apparently, that the history of science is to be studied from the philological standpoint. No one would question that philology does frequently contribute, but it can hardly be said to represent a fundamental method in the history of science.

History of science, using science with the inclusive meaning as in the title A. A. A. S., is surely the proper name for the new section now under way.

LOUIS C. KARPINSKI.

## SCIENTIFIC BOOKS

*The Crisis of the Naval War.* By Admiral of the Fleet, VISCOUNT JELLICOE OF SCAPA, G.C.B., O.M., G.C.V.O. 259 pages; 8 plates, 6 charts and appendices. George Doran Co. 1921.

This is a companion volume to Admiral Jellicoe's "The Grand Fleet, 1914–1916" which was reviewed in these columns.[1] The meeting in battle of the fleets of Great Britain and Germany was in its essence, a try-out of scientific methods of annihilation, as developed by the leading scientific nations of the world. It was said of the earlier volume that the book might aptly carry as a sub-title "Science Afloat up to 1916."

The present volume gives developments during 1917. It is not the story of a great fight like Jutland; but of undersea warfare, in which the submarine, like an assassin, struck from behind or below. Warfare on the sea had changed materially; and battleships needed screening from torpedo and mine, equally with transport and merchantman. One may well ask at this point, "Was Jutland" (in some respects the greatest naval battle ever fought; but on the whole the least decisive and most unsatisfactory) "the last great sea fight?" It seems likely; and the long line from Salamis down, draws to an end. The decisive conflicts of the future will be fought by aerial squadrons.

The present volume contains 12 chapters. The first deals with Admiralty organization and tells of the changes made in 1917. The Admiral believes that specialists (which means scientific experts) should be *part* of the staff, not just attached.

He says:

> In the Army there is, except in regard to artillery, little specialization. The training received by an officer of any of the fighting branches of the Army at the Staff College may fit him to assist in the planning and execution of operations, provided due regard is paid to questions of supply, transport, housing, etc. This is not so in the Navy.

He proceeds to show that naval officers are quite a different order of being from land officers. Further discussion of this view may be omitted here. But the Admiral preaches sound gospel, so far as men of science are concerned, when he says:

> Human nature being what it is, the safest procedure is to place the specialist officer where his voice *must* be heard, that is, give him a position on the staff.

Some rather forceful remarks follow to the effect that various divisions are not to work in water-tight compartments, but must be in close touch with one another.

We notice that in the Admiralty reorganization,

> The well-known electrical consulting engineer . . . has consented to serve as director of Experiments and Research, at the Admiralty—*unpaid.*

We italicize one word and refrain from comment.

Chapter II. gives the general features of the Submarine Campaign in the early part of 1917. We are let in on certain state secrets; such as,

> "Experienced British officers aware of the extent of the German submarine building program, and above all aware of the shadowy nature of our existing means of defense against such a form of warfare" realized that the Allies "were faced with a situation fraught with the very gravest possibilities."

[1] SCIENCE, N. S., Vol. L., No. 1279, pp. 21–23, July 4, 1919.

Throughout the chapter and also in later chapters we are given clearly to understand that the enemy submarine campaign was the gravest peril which ever threatened Great Britain.

Chapter III. tells of Anti-Submarine Operations; and while the volume lacks a dramatic climax, like Jutland, the reader whose blood runs faster because of heroic deeds, can find in this chapter stirring records of courage and defiance to the end, by the officers and men on decoy ships, drifters, trawlers and minesweepers.

Chapter IV. describes the Introduction of the Convoy System. There were not enough destroyers to give adequate protection. Requests for protection came from every quarter, but "the vessels wanted did not exist." At the end of February, 1917, the enemy had 130 submarines of all types in home waters and 20 in the Mediterranean.

A very serious situation followed the sinking of so many tankers or fuel oil ships. These vessels of great length and slow speed presented the easiest of targets for a torpedo from a submerged submarine. The reserve of oil became so perilously low that directions were issued limiting the speed of warships burning oil.

Other chapters describe the effect of the entry of the United States, the Patrol Craft and Minesweeping, Production at the Admiralty—and the Future.

The impression left on the reader is that the big fleets, big guns and big ships were to a certain degree side-tracked; and that the smaller units did most of the work and were the effective factors in winning the war. The Admiral clearly indicates this in an eloquent passage on page 188.

> I regret very deeply that in spite of a strong desire to undertake the task, I have neither the information nor the literary ability to do justice to the many deeds of individual gallantry, self-sacrifice and resource performed by the splendid officers and men who manned the small craft. No words of mine can adequately convey the intense admiration which I felt and which I know was shared by the whole Navy for the manner in which their arduous and perilous work was carried out. These fine seamen though quite strange to the hazardous work which they were called upon to undertake quickly accustomed themselves to their new duties; and the Nation should ever be full of gratitude that it bred such a race of hardy, skilful and courageous men as these who took so great a part in defeating the greatest menace with which the Empire has ever been faced.

The references to the American Navy, and in particular to Admiral Sims, are most complimentary. The laying of the mine barrage from Scotland to Norway indicates how far modern warfare at sea has changed since the days when Captain Mahan wrote his treatise on "Sea Power."

In the future, the seaplane, greatly developed of course from its present stage, will be the effective unit, both in offense and defense. With perhaps more truth the words of the Admiral regarding specialized training will hold for officers of the Air Service.

Alexander McAdie

*Diseases of Economic Plants.* By F. L. Stevens. New York, The Macmillan Company.

This is a revised edition of a former work under the same title by Stevens and Hall. It will be welcomed not only by the professional botanists, but also by a very large number of teachers, county farm demonstrators and others who are finding plant pathology a subject of increasing interest and importance. The importance of plant diseases and the very rapid progress of plant pathology makes frequent revision of a work of this kind imperative. The general plan of the work is very similar to the original edition but is somewhat enlarged and has been brought up to date. The author pays a pleasing tribute to our American workers by inserting the pictures of Farlow, Burrill, Halsted, Bessey, Atkinson and E. F. Smith, who are so well known to all students of mycology and plant pathology.

The discussions are arranged with reference to the crops on which the diseases occur. The diseases are grouped mostly with reference to